Proposal 5

A Longitudinal-Transverse Separation of Amplitudes for the $S_{11}(1535)$ Resonance

The N*-Collaboration

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ABSTRACT

We propose to measure the longitudinal contribution to the electroproduction of the $S_{11}(1535)$ resonance as a function of Q^2. The properties of the S_{11} form factor provide excellent evidence for the breakdown of SU(6) symmetry. We propose this case because in addition to its interesting physics properties, the S_{11} has a large production cross section and is easily identified through the ηp decay channel. Because all resonances are predominantly excited by transverse photons, an absolute accuracy of a few percent will be required. Given the design goals of the CEBAF electron beam and the proposed CLAS detector we expect to be able to measure total cross sections with a few percent accuracy and extract the ratio R (σ_L/σ_T) with an error of $\pm.05$. With such stringent requirements, this experiment should run in the 2^{nd} round of CLAS experiments.